Grade 4 Mathematics
Measurement: Lesson 7

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (ﻉ) by them.

Purpose of Lesson 7:
- In this lesson, the tutor and the students will
  - ✓ solve problems involving elapsed time in minutes and hours.

Equipment/Materials Needed:
- Copies of Student Sheets 106, 107
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 7:
- Run one copy of Student Sheets 106 and 107 for each student.
- Have paper and pencils available.
- Elapsed time was introduced in Lesson 4 of Measurement.

Lesson 7: Measurement

Elapsed time was introduced in Lesson 4 of Measurement, but it was taught in the lesson along with temperature. We felt that more time should be spent on this difficult concept.

Say:

> *Elapsed time* **is time that has passed. If I say the party lasted from 10:30 to 12:30, then two hours passed, or elapsed. Questions involving elapsed time will be of the following types:**
> 1. **You know when an event started and when it will end. You have to find the amount of time that has passed. The TV program started at 8:30 p.m. and ended at 9:00 p.m. How many minutes did the program last?**
> 2. **You know when an event started, and how long it will last, so you have to find when the event will end. The TV program started at 8:30 p.m. and lasted for 30 minutes. When did the program end.**
> 3. **You know when the event will end and how long it will last, so you have to find when the event will begin. The TV program was 30 minutes long and ended at 9:00 p.m. What time did it start?**

Say:

> **Elapsed time can be measured in seconds, minutes, hours, days, weeks, months, or years. For seconds, minutes, and hours, picturing a clock will help. In this lesson, you will look at elapsed time in minutes and hours.**
> Note: In Lesson 4 of Measurement, actual clocks were used. You may want to refer to that lesson and ask questions using the clocks. This lesson will focus on word problems.

 Give students Student Sheet 106. Discussion is critical. This sheet will focus on elapsed time in minutes and hours.

Answers:
1. 1 hour   2. 1:30 p.m.   3. 2:00 p.m.   4. 4:00 p.m.
5. 2:35 p.m.   6. No, the movie would be over at 9:30 p.m. which is
                         30 minutes past his bedtime.
7. 7:45 a.m.   8. 10:30 a.m.   9. 7:25 p.m.   10. 10:10 a.m.

Say:

When you make a schedule or answer questions about a schedule, you are often finding elapsed time.

͝   Give students Student Sheet 107. Discussion is critical. This sheet will involve elapsed time in minutes and hours.

Answers:
1. 1:25 p.m.   2. 13 minutes   3. 26 minutes

4. Bus 1, Busses 2 and 3 will not get her there on time. Bus 2 would not arrive until 3:37 p.m. which would be 37 minutes too late. Bus 3 would not arrive until 6:47 p.m. which would be 3 hours and 47 minutes too late.
5. No, 7 minutes late   6. Bus 3   7. 1 hr. and 5 min.

8. 2 hrs. and 2 min.

͝   Have one student summarize today's lesson. Elapsed time is important in everyday life.

Student Sheet 106 (Measurement: Lesson 7)

Answer the following questions about time.

1. Bill arrived at the movie theater at 1:15 p.m. The movie he wanted to see started at 2:15 p.m. How long did he have to wait?

2. Judy arrived at the movie theater 15 minutes after Bill. What time did she arrive?

3. Pia wanted to get to the movie theater 15 minutes before the 2:15 p.m. show. What time should she have arrived?

4. Ryan knew that the movie lasted 1 hour and 45 minutes. What time would the 2:15 show end?

5. Sandra was 20 minutes late for the 2:15 show. What time did she arrive?

6. Matthew wants to watch a movie that is 2½ hours long. He has to be in bed by 9:00 p.m. It is now 7:00 p.m. Does he have time to watch the movie? Explain.

7. Bernie got to school at 8:15 a.m. He was a half-hour late. What time did his school start?

8. On Saturdays, Crystal has breakfast at 8:30 a.m. Her tennis lesson starts an hour later and lasts for an hour. What time is her tennis lesson over?

9. Suppose you put a cake in the oven at 6:45 p.m. It takes 40 minutes to bake. What time will the cake be done?

10. Dennis flew to Dallas. His plane was supposed to leave at 9:20 a.m. It was delayed for 50 minutes. What time did the plane leave?

Student Sheet 107 (Measurement: Lesson 7)

Bus Schedule				

Bus	Arrives at Orchard Rd.	Arrives at Citrus Rd.	Arrives at King St.	Arrives at Barker Ave.
Bus 1	12:32 p.m.	12:48 p.m.	1:01 p.m.	1:25 p.m.
Bus 2	2:32 p.m.	2:52 p.m.	3:07 p.m.	3:37 p.m.
Bus 3	5:05 p.m.	5:35 p.m.	6:01 p.m.	6:47 p.m.

Sherril and her brother often ride the city bus to get to the park on Citrus Road, to the shopping Center on King Street, and to the skating rink on Barker Ave. They live on Orchard Road.

 Use the bus schedule to answer the following questions.

1. What time does the earliest bus arrive at the skating rink?

2. How long does it take the first bus to get from Citrus Road to King Street?

3. How long does it take the third bus to go from Citrus Road to King Street?

4. Sherril wants to be at the skating rink for 3:00 p.m. Which bus should she take? Why?

5. At the park, there is a concert that starts at 2:45 p.m. If Sherril and her brother take the second bus, will they be on time? If not, how early or late will they be?

6. Which bus takes 46 minutes to get from King Street to Barker Avenue?

7. How long does it take Bus 2 to get from Orchard Road to Barker Avenue?

8. Sherril arrived at the bus stop at 12:30; but the bus had come early, so she missed Bus 1. How long does she have to wait until Bus 2 arrives at her stop?